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Species status of *Geotrygon carrikeri*

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From collections made by M. A. Carriker, Jr., Wetmore (1941) described two new taxa of birds from the Los Tuxtlas region of southern Veracruz, Mexico. These taxa were a large form related to the sabrewing hummingbird *Campylopterus curvipennis* and a form related to the quail-dove *Geotrygon lawrencii* but disjunct from the remainder of the species' range by more than 1500 km. Wetmore described both as new subspecies.

Although the hummingbird has been studied in detail (R. C. Banks, pers. comm.) and elevated to species status (*Campylopterus excellens*; A.O.U. 1983), the quail-dove has remained in obscurity, with no reexamination of its distinctiveness (Goodwin 1977). On a recent visit to the U.S. National Museum of Natural History (USNM), I had the opportunity to compare the holotype and two other specimens of Wetmore's *G. l. carrikeri* with specimens from other populations of *G. lawrencii*. Being impressed with the distinctiveness of *carrikeri*, I argue in this communication for its elevation to a full species.

Wetmore listed eight characters that differentiate *carrikeri* from other populations of *G. lawrencii*. I reexamined these characters, comparing the three adult female specimens of *carrikeri* at the USNM with one female, two male, and one unsexed *lawrencii* from Panama. The *carrikeri* specimens have somewhat paler coloration

above, the centre of the back and the scapular areas lighter and more purplish, the wing coverts and tail distinctly lighter brown, the lower back and rump distinctly lighter, the malar stripe distinctly wider, and the sides and flanks strikingly paler brown (chocolate in *lawrencii*, light brown in *carrikeri*). That *carrikeri* has a lighter and brighter green crown, hindneck, and upper back, and whiter undertail coverts (Wetmore 1941) was not so obvious to me, given the pronounced individual variation in the small series available. Additional differences in coloration between the two forms include the absence of dark purplish iridescence on the upper surface of the rectrices in *carrikeri*, and the light grey (as opposed to slaty) chest of *carrikeri*.

Beyond differences in coloration, *carrikeri* is a distinctly larger bird than other populations of *G. lawrencii*. Wing chords of the three *carrikeri* females are 149, 150 and 146.5 mm (USNM 359656, 359655 and 359654, respectively), compared with 131 (USNM 483334 female), 135 (USNM 148348 unsexed), 139.5 (USNM 484281 male), and 137 mm (USNM 476039 male) in *G. l. lawrencii*. Tail lengths in the same individuals are 87, 89 and 83 mm in *carrikeri*, compared with 73, 67, 70 mm and unmeasurable in *G. l. lawrencii*; and exposed culmens are 14.88, 16.32 and 15.88 mm in *carrikeri*, compared with 13.83 mm, unmeasurable, 13.08 and 14.03 mm in *G. l. lawrencii*. Differences in tarsus length were minimal. An additional difference may or may not lie in egg colour: Andrle (1967) reported an egg of *carrikeri* to be "a plain, pale pinkish colour", whereas Olson *et al.* (1968) described an egg of *G. l. lawrencii* as "very pale buff (cream)".

Although Wetmore (1941) clearly considered *carrikeri* to be very distinct from other populations of *G. lawrencii*, subsequent workers evidently have not appreciated the differences, perhaps owing to the scarcity of specimens of both forms. *Carrikeri* is well differentiated from other *G. lawrencii* populations in several aspects of plumage coloration, and the two have non-overlapping ranges of several mensural characters. Although the two forms would certainly be considered separate phylogenetic species (McKitrick & Zink 1988), the large disjunction separating them precludes the test of sympatry critical to a decision under the biological species concept. Recent decisions under this concept have tended toward recognition of disjunct differentiated forms as full species (e.g. Banks 1990, Escalante & Peterson 1992), so I suggest that *carrikeri* would be best treated as a full species forming a superspecies with *G. lawrencii*. The relationships of these two forms with other potentially closely related quail-doves such as *G. costaricensis, G. goldmani, G. saphirina*, and perhaps even *G. veraguensis*, merit further study.

In a recent summary of avian diversity patterns in Mexico, two colleagues and I surveyed levels of species richness and endemism in 35 regions of Mexico (Escalante *et al.* in press). In that analysis, we were surprised to find that the Los Tuxtlas region presented one of the lowest levels of endemism in all of Mexico, holding only one species endemic to Mexico. This result was surprising because of the extreme isolation of the montane habitats in the region. However,

with the recognition of *Campylopterus excellens* as a full species (A.O.U. 1983), the evidence presented above for the species-level differentiation of *Geotrygon carrikeri*, and evidence of extreme differentiation of the Los Tuxtlas populations of the bush-tanager *Chlorospingus ophthalmicus* and the brush-finch *Atlapetes brunneinucha* in allozyme characters (Peterson *et al.* 1992), levels of isolation, endemism, and differentiation in the birds of the region can be seen to be nontrivial.

The conservation status of those endemic forms is, unfortunately, of increasing concern. Deforestation is taking place at a high rate in the region on both the Volcán de San Martín and the Sierra de Santa Martha. Small ranches and other settlement are being built higher and higher on the slopes of both mountain ranges. Although a small patch of lowland tropical rain forest is protected as the Estación Biológica de Los Tuxtlas, and various plans for protecting the montane parts of the region have been advanced, the forests of the Los Tuxtlas region remain all but unprotected.

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